

CHAPTER 2

DESCRIPTION OF THE COLLINS RIVER WATERSHED

- 2.1. Background**
- 2.2. Description of the Watershed**
 - 2.2.A. General Location**
 - 2.2.B. Population Density Centers**
- 2.3. General Hydrologic Description**
 - 2.3.A. Hydrology**
 - 2.3.B. Dams**
- 2.4. Land Use**
- 2.5. Ecoregions and Reference Streams**
- 2.6. Natural Resources**
 - 2.6.A. Designated State Natural Areas**
 - 2.6.B. Rare Plants and Animals**
 - 2.6.C. Wetlands**
- 2.7. Cultural Resources**
 - 2.7.A. State Scenic River**
 - 2.7.B. Nationwide Rivers Inventory**
 - 2.7.C. Interpretive Areas**
- 2.8. Tennessee Rivers Assessment Project**

2.1. BACKGROUND. The Collins River Watershed contains low to moderate gradient streams, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. There are numerous springs and spring-associated fish fauna. Land in the Collins River Watershed is utilized by cattle, grain production, and tobacco farms as well as an abundance of plant nurseries.

Streams in the watershed have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Natural areas in this region are among the most scenic in the state.

Part of the Collins River is included in the State Scenic River System due to its scenic and pastoral nature.

This Chapter describes the location and characteristics of the Collins River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Collins River Watershed is located in Middle Tennessee and includes parts of Cannon, Coffee, De Kalb, Grundy, Marion, Sequatchie, Van Buren, and Warren Counties.

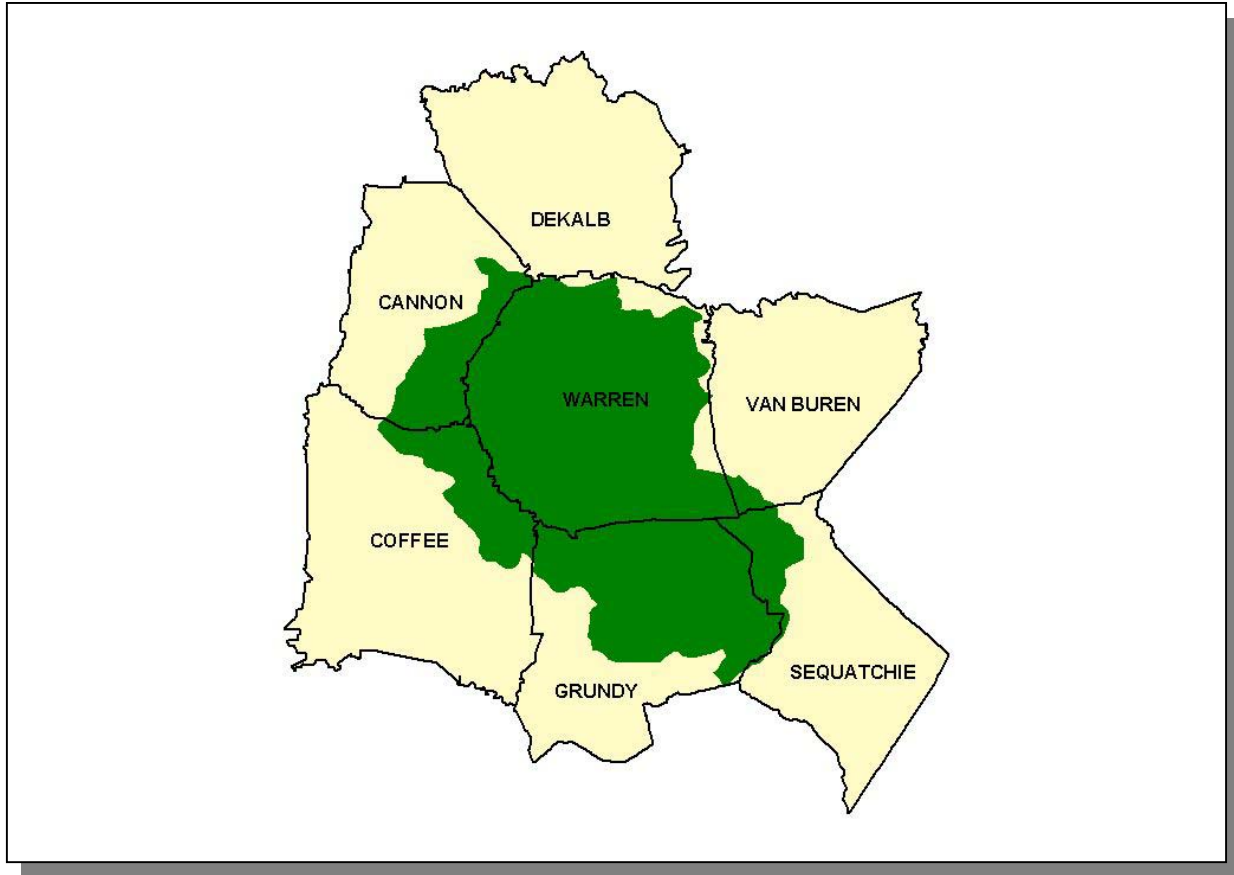


Figure 2-1. General Location of the Collins River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Warren	50.4
Grundy	26.8
Coffee	9.1
Cannon	8.9
Sequatchie	4.8

Table 2-1. The Collins River Watershed Includes Parts of Seven Middle Tennessee Counties. 238 acres (0.04662% of total acres) in DeKalb County and 11.0 acres (0.001327% of total acres) in Marion County are also in the watershed.

2.2.B. Population Density Centers. Seven state highways serve the major communities in the Collins River Watershed.



Figure 2-2. Municipalities and Roads in the Collins River Watershed.

MUNICIPALITY	POPULATION	COUNTY
McMinnville*	12,060	Warren
Gruetli-Laager	1,910	Grundy
Palmer	799	Grundy
Altamont*	719	Grundy
Beersheba Springs	607	Grundy
Morrison	594	Warren
Viola	128	Warren

Table 2-2. Municipalities in the Collins River Watershed. Population based on 1996 census (Tennessee Blue Book). Asterisk (*) indicates county seat.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Collins River Watershed, designated 05130107 by the USGS, is approximately 811 square miles and empties to the Caney Fork River.

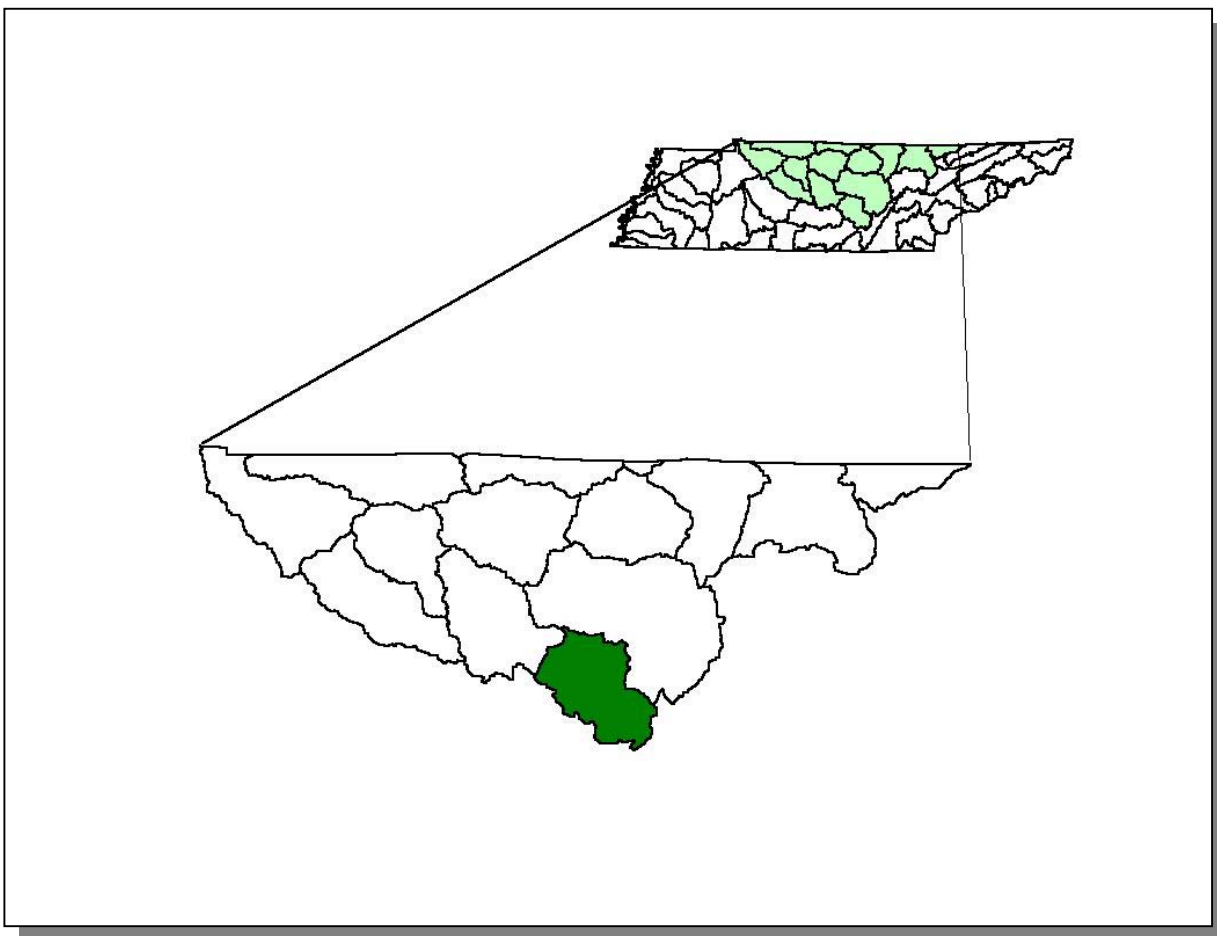


Figure 2-3. The Collins River Watershed is Part of the Cumberland River Basin.

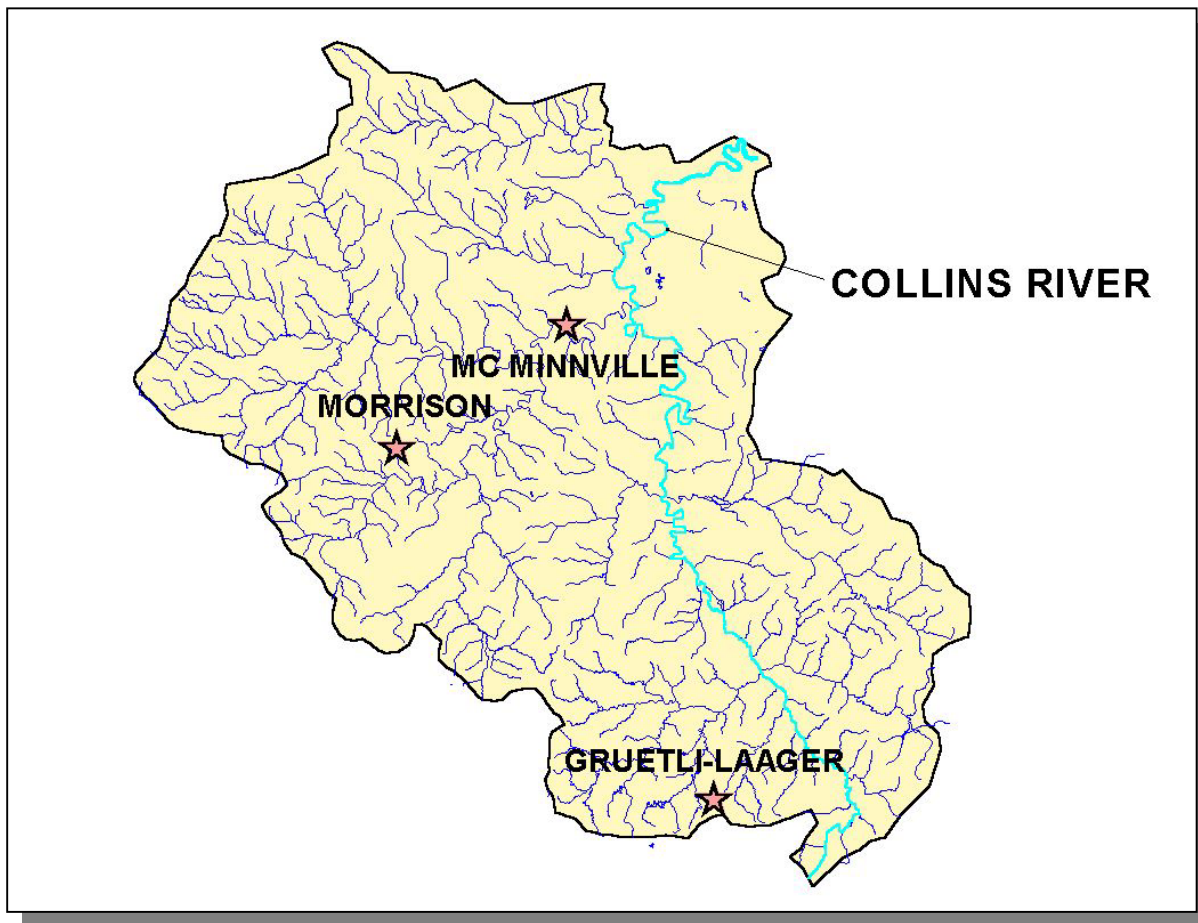


Figure 2-4. Hydrology in the Collins River Watershed. There are 1,003 stream miles and 69 lake acres recorded in River Reach File 3 in the Collins River Watershed. Location of the Collins River and the cities of Gruetli-Laager, McMinnville, and Morrison are shown for reference.

2.3.B. Dams. There are 13 dams inventoried by TDEC Division of Water Supply in the Collins River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.



Figure 2-5. Location of Inventoried Dams in the Collins River Watershed. More information is provided in Collins-Appendix II and on the TDEC homepage at:
<http://gwidc.gwi.memphis.edu/website/dams/viewer.htm>

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

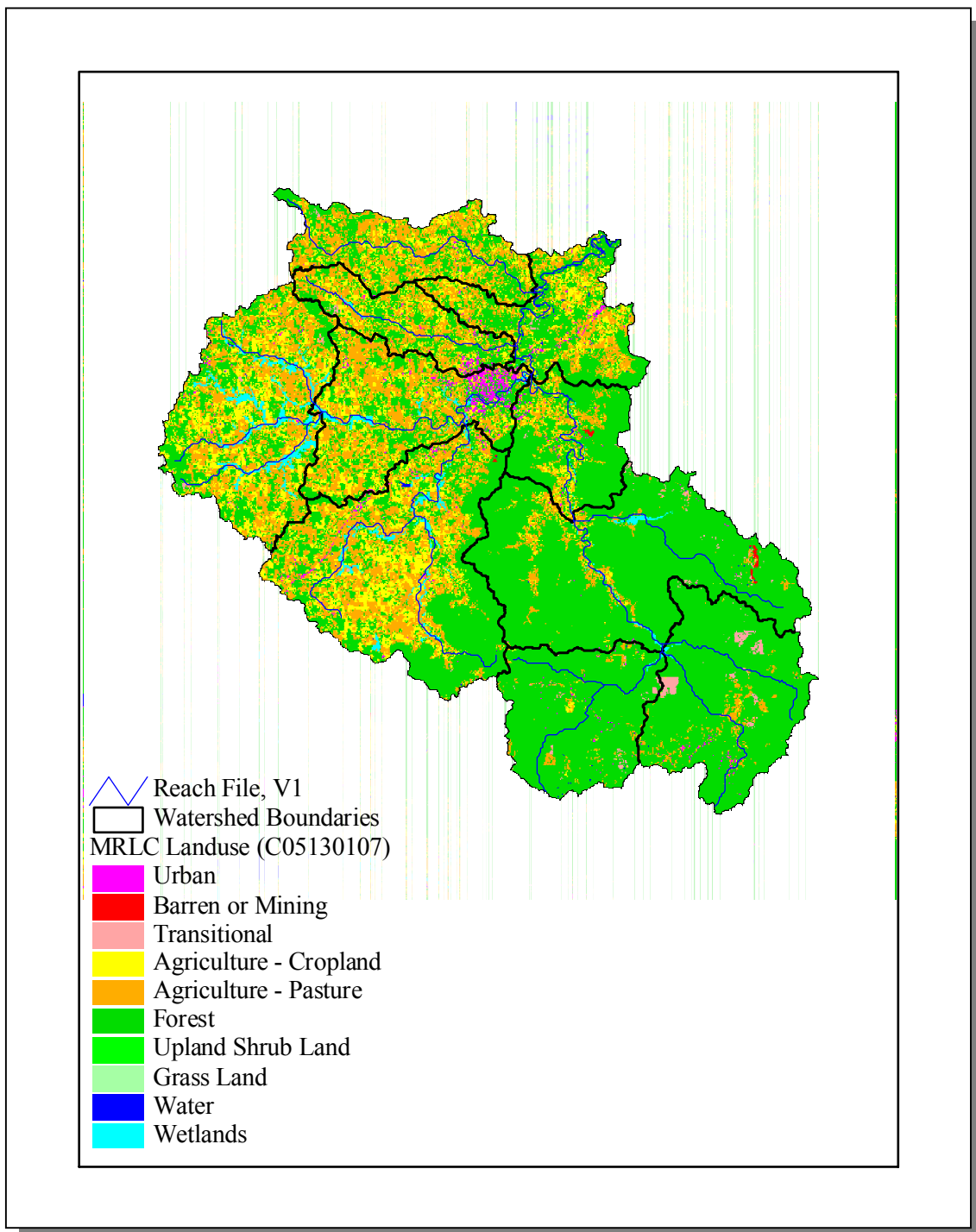


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

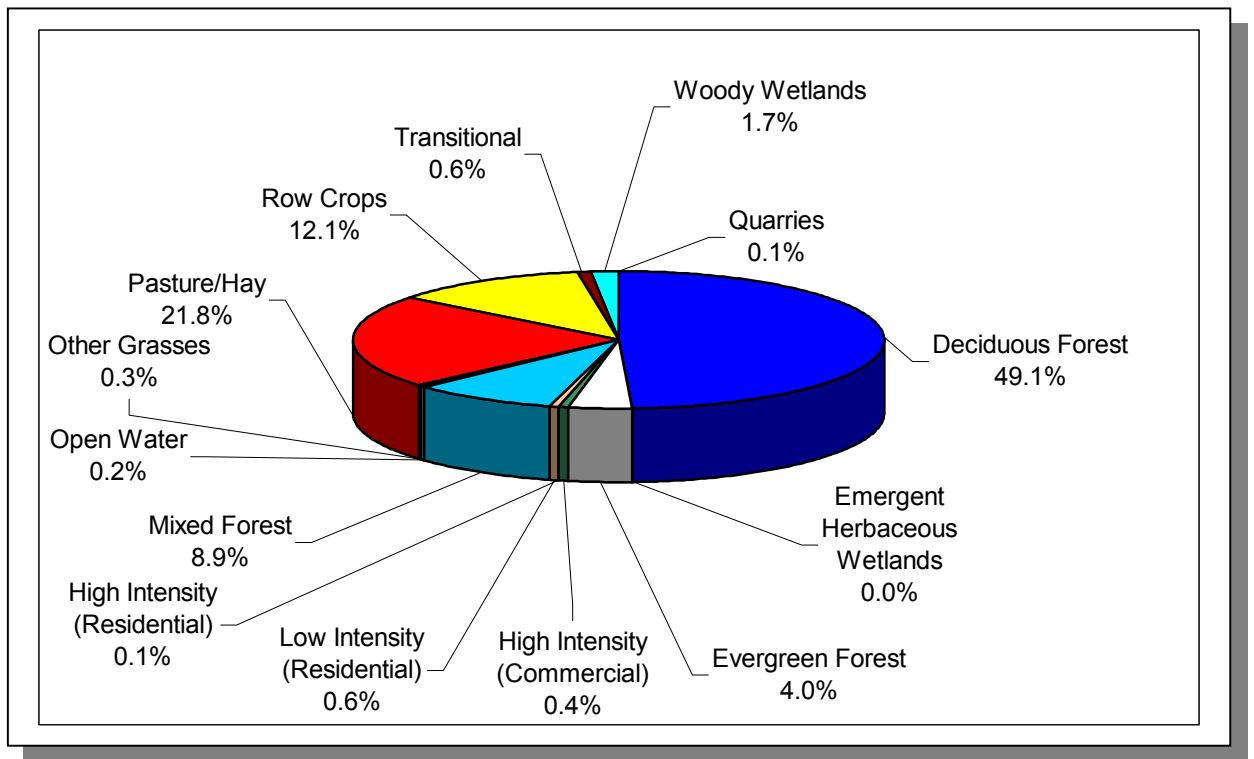


Figure 2-7. Land Use Distribution in the Collins River Watershed. More information is provided in Collins-Appendix II.

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Collins River Watershed lies within 2 Level III ecoregion (Interior Plateau and Southwestern Appalachians) and contains 4 Level IV subecoregions (Griffen, Omernik, Azavedo):

- The Cumberland Plateau's (68a) tablelands and open low mountains are about 1000 feet higher than to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief compared to the Cumberland Mountains or the Plateau Escarpment (68c). Elevations are generally 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvania-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acidic soils of low fertility. The region is forested, with some agriculture and coal mining activities.
- The Plateau Escarpment (68c) is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvania-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-basswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.
- The Eastern Highland Rim (71g) has level terrain, with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions (68, 69) to the east. Bottomland hardwood forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.
- Outer Nashville Basin (71h) is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the

generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

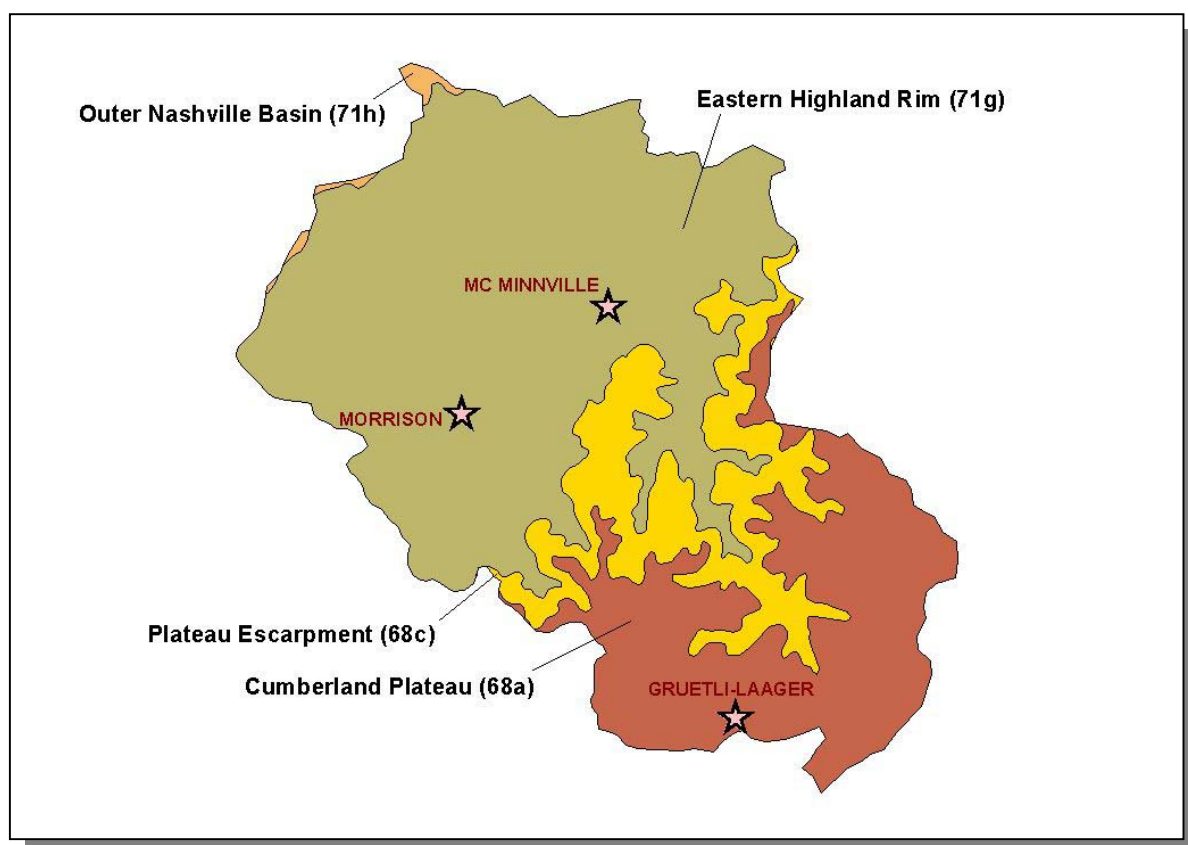


Figure 2-8. Level IV Ecoregions in the Collins River Watershed. Locations of Gruetli-Laager, McMinnville, and Morrison are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

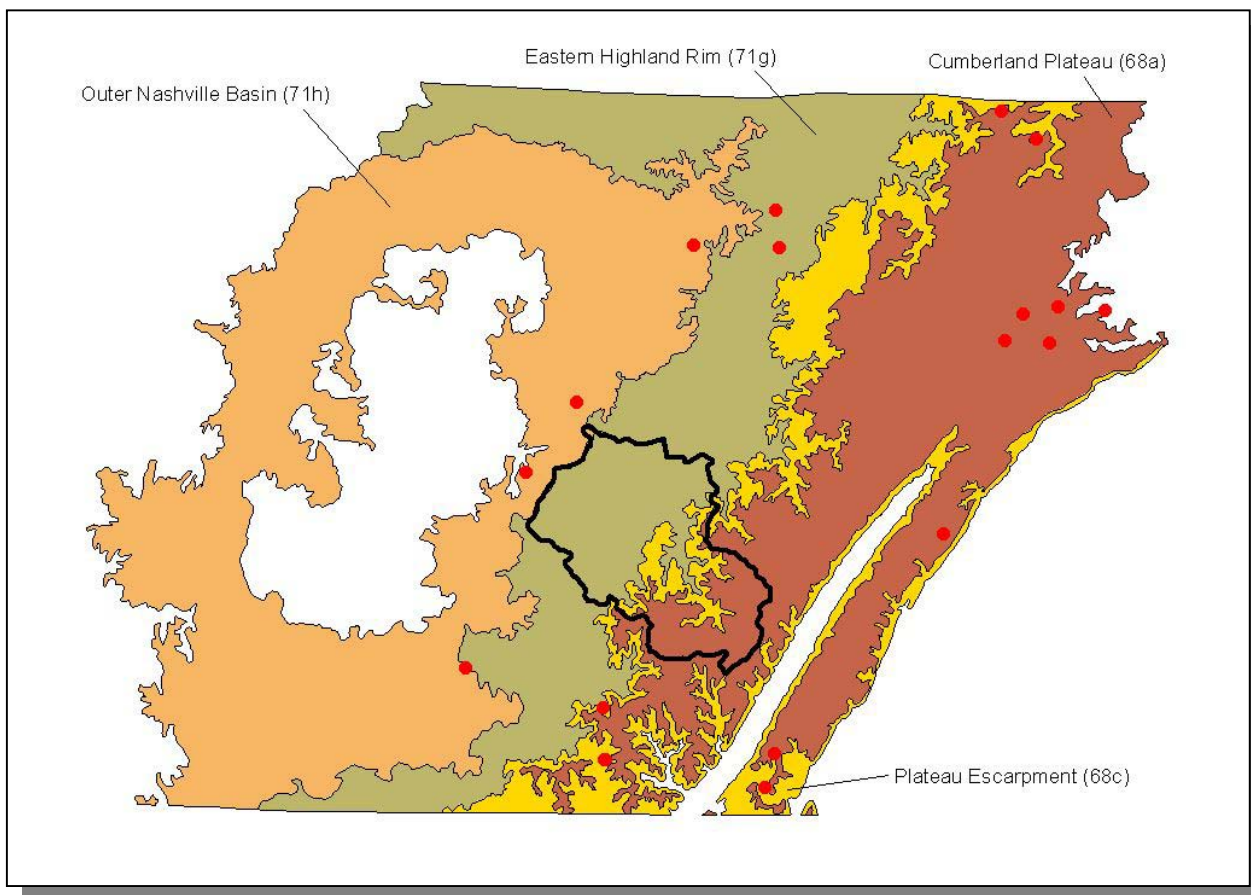


Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 68a, 68c, 71g, and 71h. The Collins River Watershed is shown for reference. More information is provided in Collins-Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Collins River Watershed has one Designated State Natural Area:

Savage Gulf State Natural Area is a scenic area with an extensive trail system that includes a trail to Stone Door, used by native Indians as a passage for centuries.

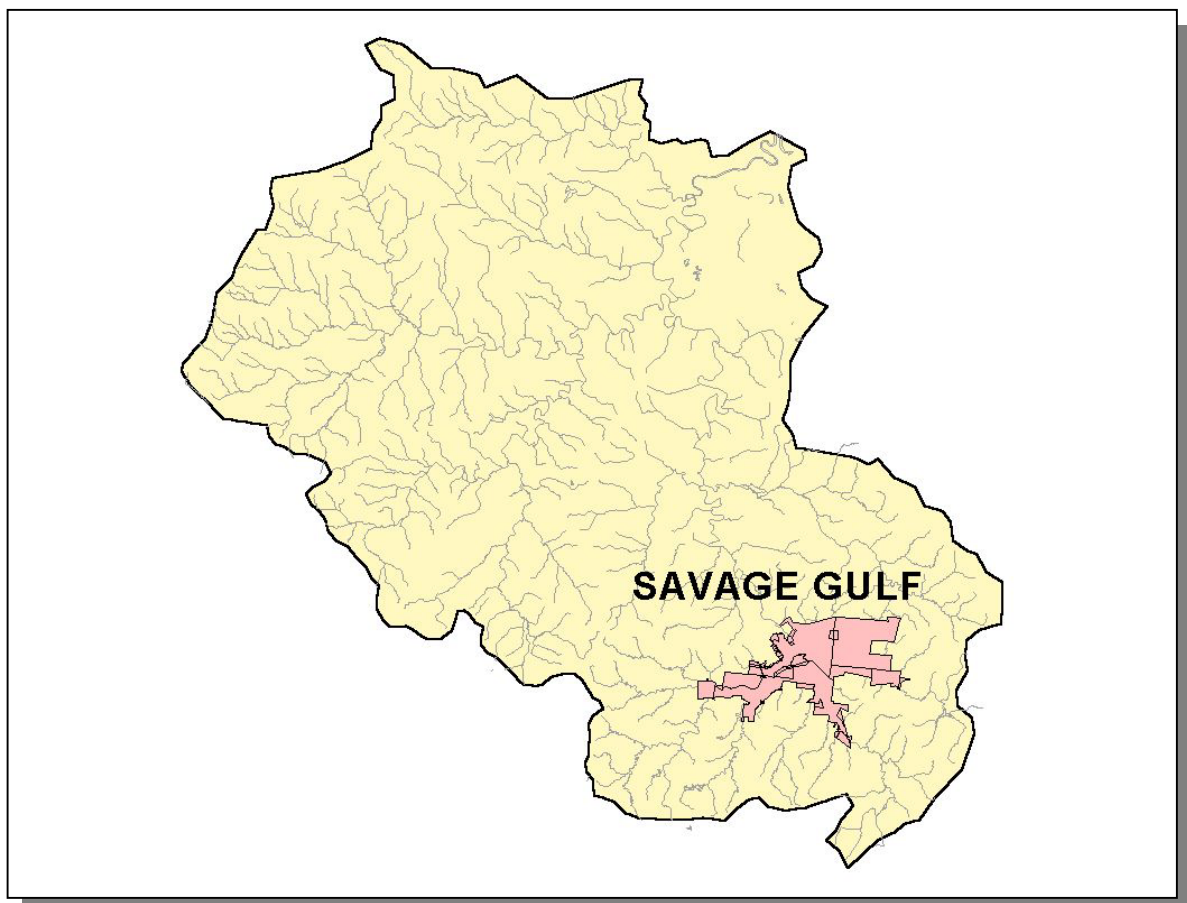


Figure 2-10. There is One Designated State Natural Area in the Collins River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	0
Insects	0
Mussels	5
Snails	3
Amphibians	3
Birds	3
Fish	8
Mammals	7
Reptiles	1
Plants	48
Total	78

Table 2-3. There are 78 Rare Plant and Animal Species in the Collins River Watershed.

In the Collins River Watershed, there are seven rare fish species, four rare mussel species, and three rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Hemitremia flammea</i>	Flame chub	MC	D
<i>Notropis rupestris</i>	Bedrock shiner		D
<i>Typhlichthys subterraneus</i>	Southern catfish	MC	D
<i>Fundulus julisia</i>	Barrens topminnow	MC	E
<i>Etheostoma luteovinctum</i>	Redband darter	MC	E
<i>Etheostoma forbesi</i>	Barrens darter	MC	E
<i>Etheostoma sp d</i>	Jewel darter (doration)	LE	E
<i>Alasmidonta atropurpurea</i>	Cumberland elktoe	LE	E
<i>Medionidus conradicus</i>	Cumberland pearlymussel	LE	E
<i>Pegias fabula</i>	Little-wing pearlymussel	LE	E
<i>Pleurobema gibberum</i>	Cumberland pigtoe	LE	E
<i>Leptoxis subglobosa umbilicata</i>	Umbilicate rocksnail		
<i>Lithasia geniculata fuliginosa</i>	Geniculate riversnail		
<i>Lithasia geniculata pinguis</i>	Small geniculate riversnail		

Table 2-4. Rare Aquatic Species in the Collins River Watershed. Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, MC, Management Concern for U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/nh/tanimal.html>

2.6.C. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at <http://www.state.tn.us/environment/epo/wetlands/strategy.zip>.

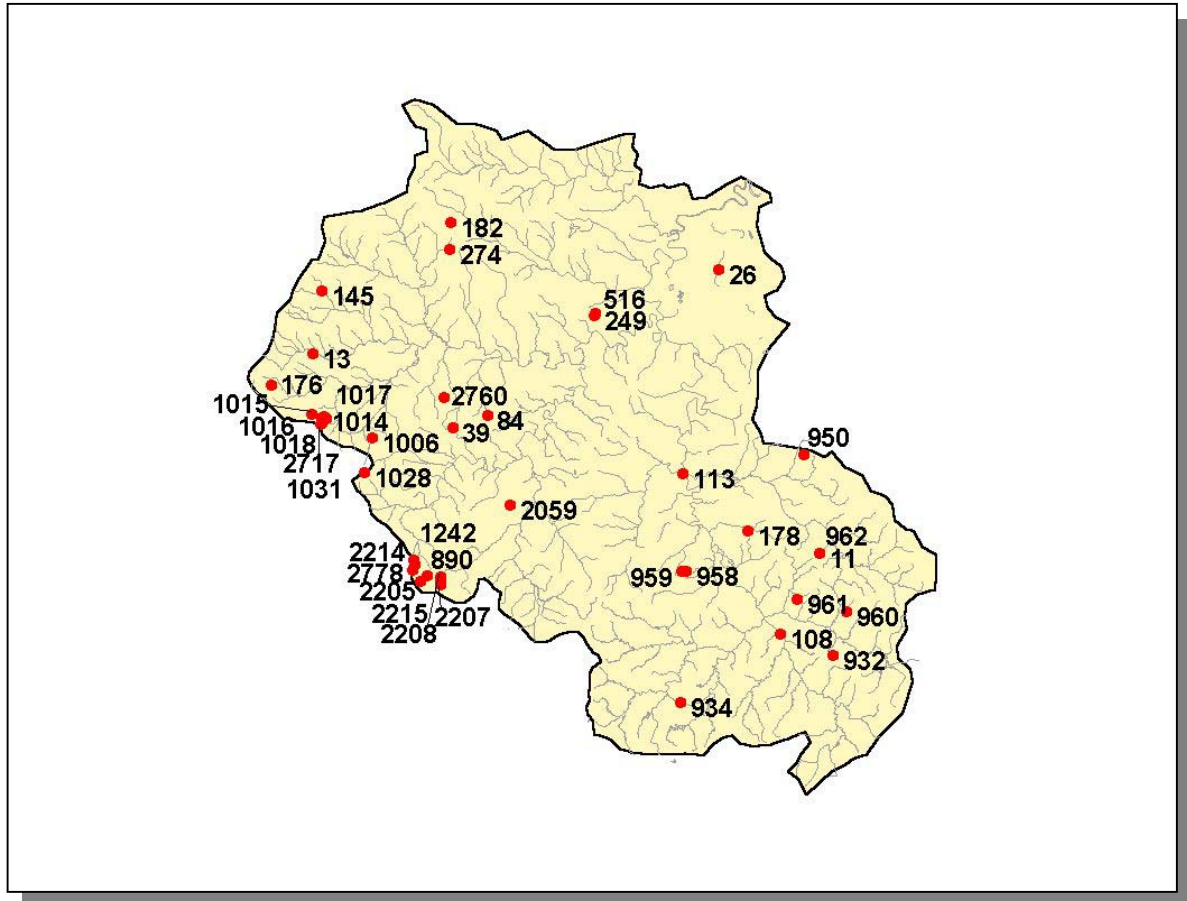


Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Collins River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information is provided in Collins-Appendix II.

2.7. CULTURAL RESOURCES.

2.7.A. State Scenic River. A portion of the Collins River has been designated as a State Scenic River. Only the segment that lies within Grundy County is designated: The segment of the Collins River that lies within the Savage Gulf natural-scientific area is designated Class II. The Tennessee Scenic Rivers Act of 1968 defines Class II as pastoral river areas.

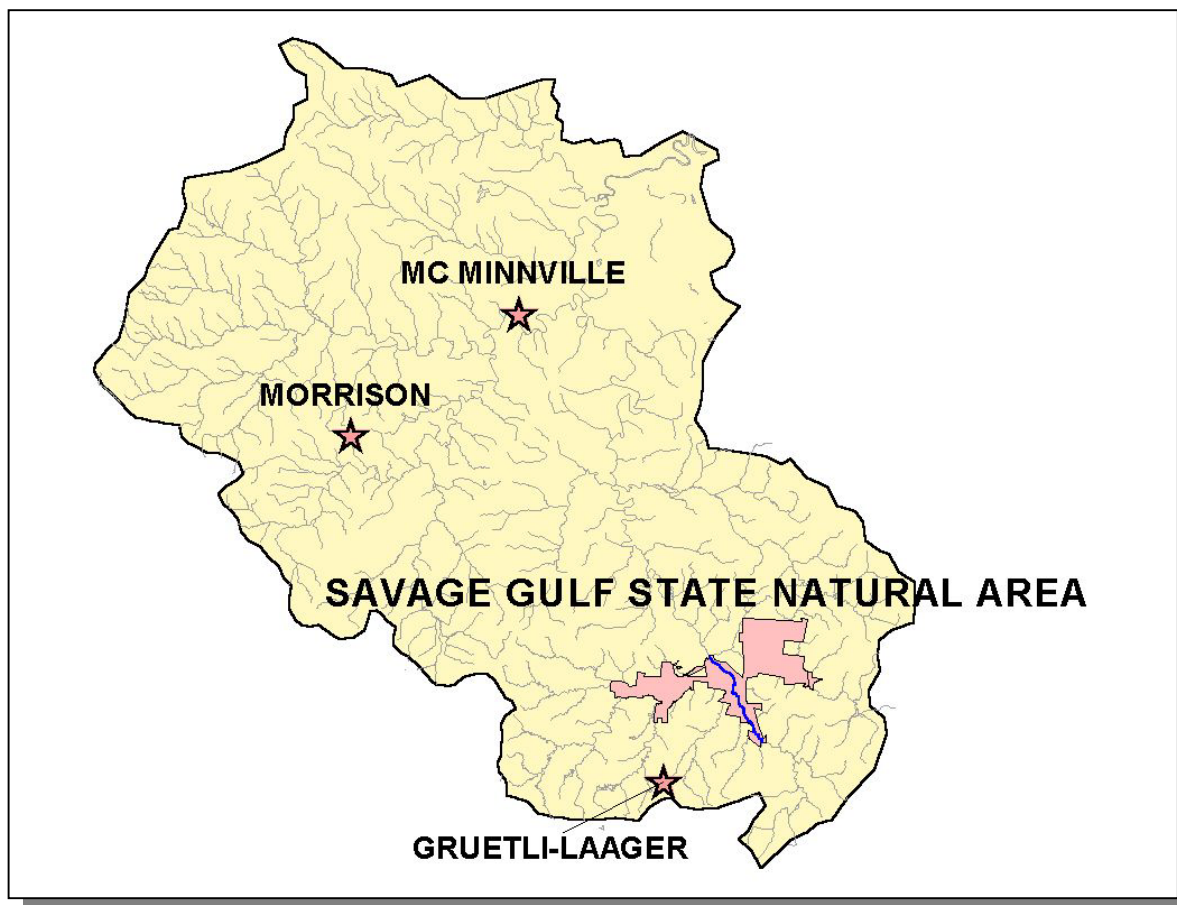


Figure 2-12. A Portion of the Collins River is Designated as a State Scenic River. Locations of Gruetli-Laager, McMinnville, and Morrison are shown for reference.

2.7.B. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers

Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of four streams in the Collins River Watershed:

Big Creek. Scenic pastoral stream.

Charles Creek. Popular scenic fishing stream.

Collins River. Slow moving clear and cold pastoral stream with long pools and mild riffles; surrounded by high-forested hills and numerous bluffs.

Mountain Creek. Scenic stream that supports game fishery.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE
Big Creek	X			X	X
Charles Creek	X			X	X
Collins River	X	X	X	X	X
Mountain Creek	X	X		X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/tn.htm>

2.7.C. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- South Cumberland State Park maintains an extensive trail system that enables the hiker to view Big Creek, Collins River, and Savage Creek as they tumble over 800 feet in elevation through narrow gorges and scenic rugged canyons.
- Rock Island State Park includes a 3 mile nature trail that winds along the riverbank of the Collins River and provides a glimpse of wildlife.
- Cumberland Caverns, a U.S. National Landmark containing great underground hallways and galleries of columns, stalactites and masses of formations.

There are also many local interpretive areas. McMinnville's Riverfront Park, a park for fishing, picnicking, and boating, is the most notable in the area.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Barren Fork River	2	3	2	North Prong Barren Fork River	1		1
Big Creek	2			Piney Creek	3		1
Carvinger Creek	1			Ranger Creek	3		3
Charles Creek	3		1	Right Branch Dry Fork Creek			4
Collins River	1,2,3	2	1	Rusty Cup Creek	3		
Cone Hollow Creek	2			Sanville Branch			
Fall Creek	3		3	Little Hickory Creek	2		
Hickory Creek	2	3	2	Savage Creek	1		
Hills Creek	3	3	1	South Prong			
Meadow Creek	3			Barren Fork River	3		
Mill Creek	2		1	Thicket Creek	3		
Mountain Creek	1		1	West Fork Hickory Creek	2		1
				Witty Creek			

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed